

WHAT IS CLAIMED IS:

1. A method for controlling data flow between a plurality of input devices and a plurality of output devices through a first or a second switch fabric interposed therebetween, wherein the first switch fabric is the operative switch fabric, and the second switch fabric is in a standby mode, said method comprising:

(a) producing a control signal prior to causing the first switch fabric to assume the standby mode and the second switch fabric to assume the operational mode;

(b) in response to the control signal, terminating the transmission of signals into the first switch fabric from the plurality of input devices;

(c) in response to the control signal, starting a drain timer; and

(d) when the drain timer has timed out, sending signals from the plurality of input devices into the second switch fabric.

2. The method of claim 1 wherein at any time there is data in transit through the first switch fabric, and wherein the drain timer has a time-out value selected such that under normal operating conditions all data will be routed out of the first switch fabric when the drain timer reaches the time-out value.

3. The method of claim 1 wherein the steps (b) and (c) further comprise:

(b1) in response to the control signal, terminating the transmission of data into the first switch fabric from the plurality of input devices;

(b2) in response to the control signal, starting a drain timer;

(b3) at the plurality of input devices, receiving a switch empty signal from the first switch fabric when there is no data in the first switch fabric;

(c) when the drain timer has timed out or the switch empty signal has been received, sending data from the plurality of input devices into the second switch fabric.

4. The method of claim 1 further comprising:

5 (d) when the drain timer has timed out, preparing to receive data from the second switch fabric at the plurality of output devices.

5. The method of claim 4 wherein the step (d) further comprises:

(d1) at the plurality of output devices, receiving a switch empty signal from the first switch fabric when there is no data in the first switch fabric;

(d2) when the drain timer has timed out or the switch empty signal has been received, preparing to receive data from the second switch fabric as the active switch fabric.

6. A method for controlling data flow between a plurality of input devices and a plurality of output devices through a first or a second switch fabric interposed therebetween, wherein the first switch fabric is the operative switch fabric, and the second switch fabric is in a standby mode, said method comprising:

(a) producing a control signal prior to causing the first switch fabric to assume the standby mode and the second switch fabric to assume the operational mode;

(b) in response to the control signal, terminating the transmission of data into the first switch fabric from the plurality of input devices;

(c) providing a switch-empty signal from the first switch fabric to the plurality of input devices when no data is in transit through the first switch fabric; and

(d) at the plurality of input devices, in response to the switch-empty signal sending data into the second switch fabric.

7. The method of claim 6 wherein the steps (c) and (d) further comprise:

(c1) providing a switch-empty signal from the first switch fabric to the plurality of input devices when no data is in transit through the first switch fabric;

(c2) in response to the control signal, starting a drain timer; and

(d) if the drain timer has timed out or the empty switch signal has been received, sending data into the second switch fabric from the plurality of input devices.

8. The method of claim 6 further comprising starting a restart timer after the drain timer has timed out or the empty switch signal has been received, wherein data is sent into the second switch fabric as the active switch fabric when the restart timer has timed out.

9. The method of claim 6 wherein the plurality of input and the output devices are associated with a packet data network.

10. The method of claim 6 wherein the plurality of input and the output devices are associated with a telephony network and wherein the data represents voice signals.

11. The method of claim 6 wherein the control signal is provided in response to a fault in the active switch fabric.

12. A method for switching between a first and a second switch fabric in a data network, wherein a plurality of line cards are connected to both the first and the second switch fabrics for transmitting and receiving data traffic, wherein at least one of the first and the second switch fabrics is the active switch fabric, said method comprising:

(a) at each of the plurality of line cards, receiving a terminate signal to discontinue operation of the active switch fabric;

(b) in response to the terminate signal, terminating the transmission of data traffic from each one of the plurality of line cards into the active switch fabric;

(c) in response to the terminate signal, at each one of the plurality of line cards, starting a timer;

(d) sending an empty switch fabric signal from the active switch fabric to each of the line cards when the active switch fabric is empty;

5 (e) at each one of the plurality of line cards, determining whether the timer has timed out or the empty fabric signal has been received

(f) redesignating the previous standby switch fabric as the active switch fabric and the previous active switch fabric as the standby switch fabric; and  
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(g) sending and receiving data traffic between each of the plurality of line cards and the active switch fabric.

13. The method of claim 12 further comprising, starting a restart timer after the drain timer has timed out or the empty switch signal has been received, wherein data traffic is sent into the second switch fabric as the active switch fabric when the restart timer has timed out.  
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14. A switch controller for controlling data flow between a first and a second switch fabric in a data network, wherein a plurality of line cards are connected to both the first and the second switch fabrics for transmitting and receiving data traffic, and wherein at least one of the first and the second switch fabrics is the active switch fabric, and wherein said switch controller is responsive to a switch fabric empty signal indicating that there is no data traffic in the active switch fabric and further responsive to a switch fabric select signal identifying the active switch fabric, said switch controller comprising:  
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a first circuit module responsive to the switch fabric select signal for providing a first signal to the plurality of line cards, wherein said first signal instructs the plurality of line cards to terminate sending data traffic into the active switch fabric;

a drain timer started in response to the switch fabric select signal for providing a first time-out signal when said drain timer has timed out;

a logic device producing a second signal in response to said first time-out signal and said fabric empty signal;

5 a restart timer started in response to said second signal for providing an enable signal when said restart timer has timed out, wherein said enable signal is input to the plurality of line cards for instructing the plurality of line cards to begin sending data traffic into the active switch, and wherein the plurality of line cards are responsive to the switch fabric  
10 select signal for identifying the active switch fabric.

15 15. The switch controller of claim 14 wherein the drain timer has a time-out value selected such that under normal operating conditions all data will be routed out of the active switch fabric when the drain timer has timed-out.

20 16. The switch controller of claim 14 wherein the restart timer has a time-out value selected such that each one of the plurality of line cards is enabled for sending and receiving data traffic at about the same time.

25 17. A switching system for carrying data traffic between a plurality of input and output lines, wherein a switch fabric select signal identifies the active switch fabric, said switching system comprising;

a first and a second switch fabric for switching data traffic between one or more of said plurality of input and output lines, wherein one of said first and said second switch fabrics is the active switch fabric, and wherein  
the active switch fabric provides an empty switch fabric signal indicating there is no data traffic in the active switch fabric;

a plurality of line cards connected to one or more of the plurality of input and output lines and further connected to said first and said second

switch fabrics for sending data traffic into and receiving data traffic from said first and said second switch fabrics;

a first circuit module responsive to the switch fabric select signal for providing a first signal to the plurality of line cards, instructing the plurality of line cards to terminate sending data traffic into the active switch fabric;

a drain timer started in response to the switch fabric select signal for providing a first time-out signal when said drain timer has timed out;

a logic device for producing a second signal in response to at least one of said first time-out signal and said fabric empty signal;

a restart timer started in response to said second signal for providing an enable signal when said restart timer has timed out, wherein said enable signal is input to the plurality of line cards for instructing the plurality of line cards to begin sending data traffic into the active switch, and wherein the plurality of line cards are responsive to the switch fabric select signal for identifying the active switch fabric.